

In the northern part of the country, rains were scant, their mean being 2.8 mm. below normal. In the central part, the observed rainfalls were somewhat above their respective normals, the average plus departure being 53.1 mm. The rains in the south were scattered.

Progress of crops remained in general good, though the yields were irregular. Due to deficiency of rainfall in the north, the yield of beans was reduced, as also that of corn, which in some places was 50 per cent short.

The state of the weather in Rio de Janeiro was in general mild. Cloudiness was slightly below normal. Temperatures remained somewhat low, giving values which were on the whole a little below the respective normals. South to east winds of moderate velocity prevailed. On the early morning of the 15th, there was a heavy squall from WSW. with a maximum velocity of 19 m/s.

*June.*—The secondary circulation remained rather active, the country having been swept by five anticyclones which moved along inland paths and in low latitudes and caused noticeable drops in temperature. Frost

were observed rather generally in the southern part of the country during the second half of the month.

For the country as a whole, rainfall was not very abundant, almost all the totals remaining below their respective normals. Due to rainfall deficit in the Amazon Basin, navigation on the rivers of that region was seriously interrupted, resulting in great detriment to commerce.

The progress of coffee, cotton, cane, rice, tobacco, wheat, corn and beans remained satisfactory, while the yield of cotton and cane were excellent. Coffee suffered a little from frosts during the latter days of the month; yields were, however, normal.

The weather in Rio de Janeiro was in general good, there being recorded only five cloudy days and three days with measurable precipitation. Mean temperature remained somewhat above normal, notwithstanding the fact that the mean minimum was 0.2 of a degree below normal.—*Transl. W. W. R. and B. M. V.*

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## SOLAR OBSERVATIONS

### SOLAR AND SKY RADIATION MEASUREMENTS DURING JULY, 1926

By HERBERT H. KIMBALL, Solar Radiation Investigations

For a description of instruments and exposures and an account of the method of obtaining and reducing the measurements, the reader is referred to the REVIEW for January, 1924, 52:42, January, 1925, 53:29, and July, 1925, 53:318.

From Table 1, it is seen that solar radiation intensities averaged slightly below the normal for July at all three stations.

Table 2 shows a deficiency in the amount of radiation received on a horizontal surface from the sun and sky, which was pronounced at Washington.

Skylight polarization measurements made on 5 days at Washington give a mean of 53 per cent, with a maximum of 56 per cent on the 12th. Measurements made on 6 days at Madison give a mean of 49 per cent, with a maximum of 65 per cent on the 14th. These are close to the corresponding averages for July at Washington and below at Madison.

TABLE 1.—Solar radiation intensities during July, 1926

[Gram-calories per minute per square centimeter of normal surface]

WASHINGTON, D. C.

Date	Sun's zenith distance										Noon
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	
	75th mer. time	Air mass									
	e.	5.0	4.0	3.0	2.0	1.0 <sup>1</sup>	2.0	3.0	4.0	5.0	e.
July 1	mm.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mm.	
7	9.83				0.78	1.06				11.38	
8	16.79				0.60	1.38	0.69	0.62		13.13	
10	11.38		0.63	0.90						11.38	
12	19.23			0.98						18.59	
16	9.83	0.84	0.97	1.11	1.40	1.05	0.67			8.81	
17	11.81	0.60	0.74	0.92						12.24	
19	13.13	0.45	0.60	0.74	1.02					13.13	
21	13.61		0.92	1.00						12.98	
22	19.88	0.63	0.74	1.21	0.77	0.61				15.65	
				0.89						15.11	
Means—		0.63	0.75	0.87	1.21	0.94	0.63				
Departures—		-0.02	-0.01	-0.02	+0.03	-0.04	-0.14				

TABLE 1.—Solar radiation intensities during July, 1926—Continued  
MADISON, WIS.

Date	Sun's zenith distance										Local mean solar time	
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°		
	75th mer. time	Air mass										
	e.	5.0	4.0	3.0	2.0	1.0 <sup>1</sup>	2.0	3.0	4.0	5.0		
July 6	mm.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mm.		
7	7.29					1.04					14.60	
13	14.60					0.99	1.26				12.68	
14	8.81						1.22				6.76	
20	8.48							1.42			9.83	
21	13.13							1.19	0.84		16.20	
23	14.60					0.76	1.09				16.20	
26	10.97					0.71	1.29				11.38	
	10.59					0.86	1.18				7.29	
Means—							0.98	1.24	(0.84)			
Departures—							-0.07	-0.03	-0.16			

### LINCOLN, NEBR.

July 11	9.83	0.82	0.95	1.27	1.55	1.08	0.85	0.75		10.59
13	7.87			1.17	1.40	1.06	0.97	0.84		7.04
18	13.13			1.04						13.61
19	15.11	0.78	0.91	1.09	1.30					14.60
20	14.10		0.94	1.12	1.31	0.98	0.77	0.61		11.38
22	12.24		0.85	1.05	1.30	0.99	0.76	0.62		7.29
23	10.59		0.74	0.87						13.61
Means—		(0.80)	0.88	1.09	1.37	1.02	0.84	0.69		
Departures—		±0.00	-0.01	+0.01	+0.04	-0.04	-0.04	-0.04		

<sup>1</sup> Extrapolated.

TABLE 2.—Solar and sky radiation received on a horizontal surface  
[Gram-calories per square centimeter of horizontal surface]

Week beginning	Average daily radiation						Average daily departure from normal		
	Washington	Madison	Lincoln	Chicago	New York	Washington	Madison	Lincoln	
	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	
July 2	384	509	475	414	368	.97	.28	.102	
9	538	585	614	405	357	+57	+55	+31	
16	439	530	630	420	440	-36	+18	+59	
23	419	426	503	413	380	-45	-64	-42	
Excess since first of year on July 29						+847	+3,388	+378	